REMARKS

In response to the Office Action dated February 27, 2007, Applicants respectfully request reconsideration based on the attached amendment and the following remarks. Applicants respectfully submit that the claims as presented herein are in condition for allowance.

Claims 1-23 are pending in the present application. Claims 1-12 and 14-22 have been amended. New claim 23 has been added, while claim 13 has been canceled. No new matter has been added by the amendments or new claim. Applicants respectfully request reconsideration of claims 1-12 and 14-23 based upon the amendments and the following remarks.

Abstract

It is respectfully noted that the Abstract of the Disclosure has been amended to correct grammatical and antecedent basis errors, as indicated by the amendments to the Abstract of the Disclosure above. No new matter has been added.

Detailed Description

It is respectfully noted that the specification has been amended to correct a reference to "the common electrode 240" which was inadvertently mislabeled as element "270" in paragraph 0051.

In addition, it is respectfully noted that the specification has been amended to correct a reference to "the semiconductor stripes 150" which was inadvertently mislabeled as element "151" in paragraph 0074.

Drawings

The Examiner has objected to the Drawings as failing to comply with 37 CFR 1.84(p)(5) because they include reference character "24" that is not mentioned in the description. The Examiner has stated that corrected Drawing sheets in compliance with 37 CFR 1.121(d) or an Amendment to the Specification to add the reference character in the Description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application.

It is respectfully noted that the specification has been amended to describe reference character "24" referenced in the drawings, as indicated by the amendments to the Specification

above. No new matter has been added. Accordingly, it is respectfully requested that the above objection to the drawings be withdrawn.

It is further respectfully noted that FIG. 8 has been amended to include the reference character "180" corresponding to the passivation layer 180 as described in the detailed description of the invention.

Claim Rejections Under 35 U.S.C. §112

Claims 4, 7-12 and 17-18 have been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicants regard as the invention. The Examiner has stated that claims 4, 10 and 17 contain the phrase "such as," rendering these claims indefinite. It is respectfully noted that claims 4, 10 and 17 have been amended to remove the phrase "such as" therefrom.

The Examiner has stated that claim 7 recites a limitation lacking a meaningful connection between elements "a drain electrode" and "a semiconductor layer." It is respectfully noted that the element "a drain electrode" has been deleted from claim 7. Thus, a meaningful connection between "a drain electrode" and "a semiconductor layer" is not required in amended claim 7.

The Examiner has stated that claims 8, 9, 11 and 18 lack sufficient antecedent basis. It is respectfully noted that claims 8, 9, 11 and 18 have been amended such that sufficient antecedent basis is provided therein. Specifically:

Claim 8 has been amended to reference "an inclination angle" and "a surface" providing sufficient antecedent basis for all elements of claim 8;

Claim 7, from which claim 9 depends, has been amended to reference "a pixel electrode;"

Claim 11 has been amended to depend from claim 7 (through claim 9) thus providing sufficient antecedent basis for "the pixel electrode" of claim 11; and

Claim 18 has been amended to reference "an inclination angle" instead of "the inclination angle" and claim 14, from which claim 18 depends (through claim 15), has been amended to comprise "a substrate" having "a surface" such that claim 18 contains sufficient antecedent basis for "the surface of the substrate."

Finally, the Examiner has stated that claim 12 is rejected as being dependant upon claim 7. It is respectfully noted that the amendment described above with respect to claim 7 renders claim 12 allowable at least under § 112, second paragraph.

Accordingly, it is respectfully requested that the above rejections to claims 4, 7-12 and 17-18 under 35 U.S.C. § 112, second paragraph be withdrawn.

Claim Rejections Under 35 U.S.C. §102

To anticipate a claim under 35 U.S.C. § 102, a single source must contain all of the elements of the claim. *Lewmar Marine Inc. v. Barient, Inc.*, 827 F.2d 744, 747, 3 U.S.P.Q.2d 1766, 1768 (Fed. Cir. 1987), cert. denied, 484 U.S. 1007 (1988).

Claims 1-2 and 20-21 have been rejected under 35 U.S.C. § 102(b) as being allegedly unpatentable over Amundson (U.S. Patent No. 6,545,291 B1, hereinafter "Amundson") as stated on pages 4 and 5 of the Detailed Action. Applicants respectfully traverse for at least the following reasons.

Regarding claims 1-2 and 20-21, it is respectfully noted that Amundson discloses a thin film transistor (column 10, lines 47-54 and FIG. 3) having a channel (column 2, line 62) and a pixel electrode (column 10, line 50), a portion of which overlaps a portion of the channel and a data line (FIG. 5A) and a portion of a gate electrode (FIG. 3).

Amundson does not teach or suggest, however, a first pixel electrode overlapping one of the gate line and the data line and a second pixel electrode overlapping the one of the gate line and the data line as in amended claims 1 and 20. Thus, it is respectfully submitted that claims 1 and 2, including claims depending therefrom, i.e., claims 2-6 and 21-22 and more specifically claims 2 and 21, define over Amundson.

Claims 7 and 11 have been rejected under 35 U.S.C. § 102(b) as being allegedly unpatentable over Drzaic (U.S. Patent No. 6,518,949 B2, hereinafter "Drzaic '949"). Applicants respectfully traverse for at least the following reasons.

Regarding claim 7, it is respectfully noted that Drzaic '949 discloses a transistor protected from, for example, light by a barrier layer (column 9, lines 39-40 and FIGS. 8-9) which is positioned over at least the semiconductor layer (column 10, lines 3-5) and which is opaque (column 9, line 49). Further, Drzaic discloses in FIG. 1a pixel electrodes 18 covering/overlapping both data lines 15 and gate lines 17 completely, while FIGS. 1b and 1c of

Drzaic do not disclose any overlap of the pixel electrodes 18 with either of the data lines 15 and gate lines 17.

Drzaic '949 does not teach or suggest a first pixel electrode overlapping one of the gate line and the data line and a second pixel electrode overlapping the one of the gate line and the data line, as recited in amended claim 7. Thus, it is respectfully submitted that claim 7, including claims depending therefrom, i.e., claims 8-13 and more specifically claim 11, define over Drzaic '949.

Claim 14 has been rejected under 35 U.S.C. § 102(e) as being allegedly unpatentable over Hasegawa (U.S. Patent No.7,173,602 B2, hereinafter "Hasegawa"). Applicants respectfully traverse for at least the following reasons.

It is respectfully noted that Hasegawa discloses an electrophoretic display comprising a substrate (column 6, lines 55-56) and a thin film transistor (column 9, line 9) including an insulating substrate (column 9, lines 9-14).

However, Hasegawa does not teach or suggest a semiconductor layer formed on the source and the drain electrode as in amended claim 14. Thus, it is respectfully submitted that claim 14 defines over Hasegawa.

Accordingly, it is respectfully requested that the above rejections to claims 1-2, 7, 11, 14 and 20-21 under 35 U.S.C. § 102 be withdrawn.

Claim Rejections Under 35 U.S.C. §103

Claims 3, 6 and 22 have been rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Amundson in view of Yamamoto (U.S. Patent No. 6,563,260 B1, hereinafter "Yamamoto"). Applicants respectfully traverse for at least the following reasons.

The Examiner has stated that Amundson teaches all elements of claim 3 and 22 except for the insulating layer having a dielectric constant lower than 4 which the Examiner has stated is taught by Yamamoto in column 13 lines 58-60. Further, the Examiner has stated that Amundson teaches all elements of claim 6, except for the insulating layer and being made of made of a-Si:C:O or a-Si:O:F (claim 6), which the Examiner has stated is taught by Yamamoto in column 13 lines 53-54.

Independent claim 1, from which claims 3 and 6 depend, and independent claim 20, from which claim 22 depends, are submitted as being allowable for defining over Amundson as

discussed above. In addition, it is respectfully submitted that use of the insulating layer having a dielectric constant lower than 4 and being made of a-Si:C:O or a-Si:O:F allegedly taught in Yamamto or any other disclosure of Yamamoto do not cure the deficiencies noted above with respect to Amundson.

Furthermore, while Amundson teaches an insulating layer (column 11, lines 6-9) and Yamamoto teaches an insulating layer having a dielectric constant of 4.0 or less (column 13 lines 58-60) and being made of a-Si:O:F, e.g., SiO_2 with fluorine added (column 13, lines 52-53), it is respectfully noted that Yamamoto specifically attributes the dielectric constant being lower than 4.0 as being due to the presence of the fluorine in SiO2 (column 13, lines 52-53 and column 14, lines 56-60).

There is no suggestion or motivation in either Amundson or Yamamoto to add carbon to the SiO2, e.g., to make the insulating layer out of a-Si:C:O, to achieve a dielectric constant of less than 4 in the present invention. Furthermore, there is no suggestion in either Amundson or Yamamoto that adding carbon to SiO2, e.g., using a-Si:C:O would provide an advantage over the a-Si:O:F insulating layer taught in Yamamoto. Thus, Applicants respectfully submit that claims 6 and 22 of the present invention are patentable over the cited references for this additional reason, as well.

Accordingly, it is respectfully submitted that the rejection of claims 3, 6 and 22 under 35 U.S.C. 103(a) be withdrawn.

Claim 4 has been rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Amundson in view of Izumi (U.S. Patent No. 7,148,867 B2, hereinafter "Izumi"). Applicants respectfully traverse for at least the following reasons.

The Examiner has stated that Amundson teaches all elements of amended claim 4 except the data line is made of a metal selected from a group consisting of Mo, Mo alloy, Cr, Ta and Ti, which the Examiner has stated is taught by Izumi in column 8, lines 10-13, wherein gate lines or source lines "may be formed by patterning a metal film of Al, Ta, Mo or Cu or a conductive film of ITO, for example."

Independent claim 1, from which claim 4 depends, is submitted as being allowable for defining over Amundson as discussed above. Furthermore, it is respectfully submitted that use of the data line being made of a metal selected from a group consisting of Mo, Mo alloy, Cr, Ta

and Ti allegedly taught in Izumi or any other disclosure of Izumi do not cure the deficiency noted above with respect to Amundson.

Thus, Applicants respectfully submit that claim 4 of the present invention is patentable over the cited references.

Accordingly, it is respectfully submitted that the rejection of claim 4 under 35 U.S.C. 103(a) be withdrawn.

Claim 5 has been rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Amundson in view of Drzaic (U.S. Patent No. 7,030,412 B1, hereinafter "Drzaic '412"). Applicants respectfully traverse for at least the following reasons.

The Examiner has stated that Amundson teaches all elements of amended claim 5 except the pixel electrode is made of an opaque material, which the Examiner has stated is taught by Drzaic '912 in column 10, lines 62-63.

Independent claim 1, from which claim 5 depends, is submitted as being allowable for defining over Amundson as discussed above. Furthermore, it is respectfully submitted that use of the pixel electrode being made of an opaque material as taught in Drzaic '921 or any other disclosure of Drzaic '921 do not cure the deficiencies noted above with respect to Amundson.

Thus, Applicants respectfully submit that claim 5 of the present invention is patentable over the cited references.

Accordingly, it is respectfully submitted that the rejection of claim 5 under 35 U.S.C. 103(a) be withdrawn.

Claim 8 has been rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Drzaic '949 in view of Hirota (U.S. Patent No. 7,098,980 B2, hereinafter "Hirota"). Applicants respectfully traverse for at least the following reasons.

The Examiner has stated that Drzaic '949 teaches all elements of amended claim 8 except wherein an inclination angle of the gate or the data line relative to a surface of the substrate ranges from about 20 degrees to about 80 degrees, which the Examiner has stated is taught by Hirota in column 5 lines 28-34, wherein a bendable electrode having a range of bending angle between 60 and 120 degrees, excluding 90 degrees, is taught.

Independent claim 7, from which claim 8 depends, is submitted as being allowable for defining over Drzaic '949 as discussed above. Furthermore, it is respectfully submitted that use of an inclination angle of the gate or the data line relative to the surface of the substrate ranges from about 20 degrees to about 80 degrees allegedly taught by Hirota or any other disclosure of Hirota do not cure the deficiencies noted above with respect to Drzaic '949.

More specifically, the bending angle in Hirota refers to angles associated with the layout of scanning lines, pixel electrodes and common electrodes on a substrate such that the scanning lines, pixel electrodes and common electrodes form a zigzag shape (see column 5, lines 27-31 and FIGS. 5 and 6). Thus, the bending angle in Hirota is completely unrelated or similar to the inclination angle of data and gate lines relative to a substrate as described in claim 8 of the present invention. Furthermore, there is no suggestion or motivation in either Drzaic '949 or Hirota to make an inclination angle of the gate or the data line relative to the surface of the substrate ranges from about 20 degrees to about 80 degrees. Finally, there is no suggestion in either Drzaic '949 or Hirota that an inclination angle of the gate or the data line relative to the surface of the substrate ranges from about 20 degrees to about 80 degrees would provide an advantage over the bending angle taught in Hirota.

Thus, Applicants respectfully submit that claim 8 of the present invention is patentable over the cited references.

Accordingly, it is respectfully submitted that the rejection of claim 8 under 35 U.S.C. 103(a) be withdrawn.

Claims 9 and 12 have been rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Drzaic '949 in view of Yamamoto. Applicants respectfully traverse for at least the following reasons.

The Examiner has stated that Drzaic '949 teaches all elements of claims 9 and 12 except for the insulating layer having a dielectric constant lower than 4 (claim 9) and the insulating layer and being made of made of a-Si:C:O or a-Si:O:F (claim 12).

Independent claim 7, from which claims 9 and 12 depend is submitted as being allowable for defining over Drzaic '949 as discussed above. In addition, it is respectfully submitted that use of the insulating layer having a dielectric constant lower than 4 and being made of a-Si:C:O

or a-Si:O:F allegedly taught in Yamamoto or any other disclosure of Yamamota do not cure the deficiencies noted above with respect to Drzaic '949.

Furthermore, while Drzaic '949 teaches an insulating layer (column 4 lines 59-64) and Yamamoto teaches an insulating layer having a dielectric constant of 4.0 or less (column 13 lines 58-60) and being made of a-Si:O:F, e.g., SiO_2 with fluorine added (column 13 lines 52-53), it is respectfully noted that Yamamoto specifically attributes the dielectric constant being lower than 4.0 due to the presence of the fluorine in SiO2 (column 13 lines 52-53 and column 14 lines 56-60), as discussed above.

There is no suggestion or motivation in either Drzaic '949 or Yamamoto to add carbon to the SiO2, e.g., to make the insulating layer out of a-Si:C:O, to achieve a dielectric constant of less than 4 in the present invention. Furthermore, there is no suggestion in either Drzaic '949 or Yamamoto that adding carbon to SiO2, e.g., using a-Si:C:O would provide an advantage over the a-Si:O:F insulating layer taught in Yamamoto.

Thus, Applicants respectfully submit that claims 9 and 12 of the present invention are patentable over the cited references.

Accordingly, it is respectfully submitted that the rejection of claims 9 and 12 under 35 U.S.C. 103(a) be withdrawn.

Claim 10 has been rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Drzaic '949 in view of Izumi. Applicants respectfully traverse for at least the following reasons.

The Examiner has stated that Drzaic '949 teaches all elements of amended claim 10 except the data line is made of a metal selected from a group consisting of Mo, Mo alloy, Cr, Ta and Ti, which the Examiner has stated is taught by Izumi in column 8 lines 10-13, wherein gate lines or source lines "may be formed by patterning a metal film of Al, Ta, Mo or Cu or a conductive film of ITO, for example."

Independent claim 7, from which claim 10 depends, is submitted as being allowable for defining over Drzaic '949 as discussed above. Furthermore, it is respectfully submitted that use of the data line being made of a metal selected from a group consisting of Mo, Mo alloy, Cr, Ta and Ti allegedly taught in Izumi or any other disclosure of Izumi do not cure the deficiencies noted above with respect to Drzaic '949.

Thus, Applicants respectfully submit that claim 10 of the present invention is patentable over the cited references.

Accordingly, it is respectfully submitted that the rejection of claim 10 under 35 U.S.C. 103(a) be withdrawn.

Claim 13 has been rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Drzaic '949 in view of Amundson. Applicants respectfully traverse for at least the following reasons.

The Examiner has stated that Drzaic '949 teaches all elements of amended claim 13 except the pixel electrode overlaps a portion of a width of the data line and a portion of a width of the gate line, which the Examiner has stated is taught by Amundson.

Independent claim 7, from which claim 13 depends, is submitted as being allowable for defining over Drzaic '949 as discussed above. Furthermore, it is respectfully submitted that use of the pixel electrode overlapping a portion of the data line and a portion of the gate line allegedly taught in Amundson or any other disclosure of Amundson do not cure the deficiencies noted above with respect to Drzaic '949.

Thus, Applicants respectfully submit that claim 13 of the present invention is patentable over the cited references.

Accordingly, it is respectfully submitted that the rejection of claim 13 under 35 U.S.C. 103(a) be withdrawn.

Claim 15 has been rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Hasegawa in view of Amundson. Applicants respectfully traverse for at least the following reasons.

The Examiner has stated that Hasegawa teaches all elements of amended claim 15 except a portion of the pixel electrode overlaps a portion of a width of the gate line and a portion of a width of the data line, which the Examiner has stated is taught by Amundson in column 12, lines 25-32 and column 2, lines 54-58, respectively.

Independent claim 14, from which claim 15 depends, is submitted as being allowable for defining over Hasegawa as discussed above. Furthermore, it is respectfully submitted that use of the pixel electrode overlapping a portion of the gate line and a portion of the data line

allegedly taught in Amundson or any other disclosure of Amundson do not cure the alleged deficiencies noted above with respect to Hasegawa.

Thus, Applicants respectfully submit that claim 15 of the present invention is patentable over the cited references.

Accordingly, it is respectfully submitted that the rejection of claim 15 under 35 U.S.C. 103(a) be withdrawn.

Claims 16 and 19 have been rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Hasegawa in view of Amundson in further view of Yamamoto. Applicants respectfully traverse for at least the following reasons.

The Examiner has stated that Hasegawa teaches all elements of amended claims 16 and 19 except for the insulating layer having a dielectric constant lower than 4 (claim 16) and the insulating layer and being made of made of a-Si:C:O or a-Si:O:F (claim 19), which the Examiner has stated is taught by Amundson in further view of Yamamoto as described above.

Independent claim 14, from which claims 16 and 19 depend, is submitted as being allowable for defining over Hasegawa as discussed above. Furthermore, it is respectfully submitted that use of the insulating layer having a dielectric constant lower than 4 (claim 16) and the insulating layer and being made of made of a-Si:C:O or a-Si:O:F (claim 19) allegedly taught in Amundson in further view of Yamamoto or any other disclosure of Amundson in further view of Yamamoto do not cure the deficiencies noted above with respect to Hasegawa.

Thus, Applicants respectfully submit that claims 16 and 19 of the present invention are patentable over the cited references.

Accordingly, it is respectfully submitted that the rejection of claims 16 and 19 under 35 U.S.C. 103(a) be withdrawn.

Claim 17 has been rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Hasegawa in view of Amundson in further view of Izumi. Applicants respectfully traverse for at least the following reasons.

The Examiner has stated that Hasegawa teaches all elements of amended claim 17 except the data line is made of a metal selected from a group consisting of Mo, Mo alloy, Cr, Ta and Ti, which the Examiner has stated is taught by Amundson in further view of Izumi.

Independent claim 14, from which claim 17 depends, is submitted as being allowable for defining over Hasegawa as discussed above. Furthermore, it is respectfully submitted that use of the data line is made of a metal selected from a group consisting of Mo, Mo alloy, Cr, Ta and Ti allegedly taught in Amundson in further view of Izumi or any other disclosure of Amundson in further view of Izumi do not cure the deficiencies noted above with respect to Hasegawa.

Thus, Applicants respectfully submit that claim 17 of the present invention is patentable over the cited references.

Accordingly, it is respectfully submitted that the rejection of claim 17 under 35 U.S.C. 103(a) be withdrawn.

Claim 18 has been rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Hasegawa in view of Amundson in further view of Hirota. Applicants respectfully traverse for at least the following reasons.

The Examiner has stated that Hasegawa teaches all elements of amended claim 18 except wherein an inclination angle of the gate or the data line relative to the surface of the substrate of the substrate ranges from about 20 degrees to about 80 degrees, which the Examiner has stated is taught by Amundson in further view of Hirota.

Independent claim 14, from which claim 18 depends, is submitted as being allowable for defining over Hasegawa as discussed above. Furthermore, it is respectfully submitted that use of an inclination angle of the gate or the data line relative to the surface of the substrate ranges from about 20 degrees to about 80 degrees allegedly taught in Amundson in further view of Hirota or any other disclosure of Amundson in further view of Hirota do not cure the deficiencies noted above with respect to Hasegawa.

More specifically, as discussed above in greater detail in reference to the Examiner's rejection of claim 8 as being unpatentable under 35 U.S.C. 103(a) over Drzaic '949 in view of Hirota, the bending angle in Hirota refers to angles associated with the layout of scanning lines, pixel electrodes and common electrodes on a substrate such that the scanning lines, pixel electrodes and common electrodes form a zigzag. Thus, the bending angle in Hirota is completely unrelated or similar to the inclination angle of data and gate lines relative to a substrate as described in claim 18 of the present invention.

Thus, Applicants respectfully submit that claim 18 of the present invention is patentable over the cited references.

Accordingly, it is respectfully submitted that the rejection of claim 18 under 35 U.S.C. 103(a) be withdrawn.

In accordance with the reasons discussed above, it is respectfully requested that the rejections to claims 3-6, 8-10, 12-13, 15-19 and 22 under 35 U.S.C. § 103 be withdrawn.

Conclusion

In view of the foregoing remarks distinguishing the prior art of record, Applicants submit that this application is in condition for allowance. Early notification to this effect is requested. The Examiner is invited to contact Applicants' Attorneys at the below-listed telephone number regarding this Amendment or otherwise regarding the present application in order to address any questions or remaining issues concerning the same. If there are any charges due in connection with this response, please charge them to Deposit Account 06-1130.

Respectfully submitted,

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